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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,139	08/04/2003	Ilya V. Karpov	ITO.0551US (P16253)	5082
21906	7590	08/21/2006	EXAMINER	
TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			LE, DUNG ANH	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 08/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/634,139

Applicant(s)

KARPOV, ILYA V.

Examiner

DUNG A. LE

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-31 and 33-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-31 and 33-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1- 10 and 32 are canceled.

Claims 11- 31 and 33-35 are pending in this application.

Claim Rejections

Claim Rejections - 35 USC § 112

Independent Claims 11, 22 and 31 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant introduces the new matter by adding :

“an planer electrode over said phase change material, said phase change material being free of material from said electrode” into claims 11 and 22.

“...being free of material from said electrode...second electrode being planar.” in claim 31.

The added matter(s) is(are) not supported in the Specification and it (they) (is) are not satisfactory resolved and consequently raise doubt as to possession o the claimed invention at the time of filling.

Claims 11 and 22 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 7 of claim 11, the language of “said electrode” is insufficient antecedent basis for this limitation in the claim. It is unclear as to whether it is being referred to first electrode or planar electrode.

In claim 9 of claim 22, the language of “said electrode” is insufficient antecedent basis for this limitation in the claim. It is unclear as to whether it is being referred to a electrode or a planar electrode.

The remaining claims are dependent from the above rejected claims and therefore also considered indefinite.

Set of claims 11- 21

Claims 11,14-15,17-21 are rejected under 35 USC 102 (e) as being anticipated by Campbell (6921912 B2).

Campbell teaches a memory (especially refer to figs. 11-13 and related texts) comprising:

an insulator 120/122 over a substrate 110, said insulator including a pore (fig. 11 and related texts) having an electrode 170 over the substrate and a phase change material 155/145 over the electrode; and

an planer electrode 135 over said phase change material, said phase change material being free of material from said electrode (figs. 11A-11B and related texts).

Regarding claim 14, the phase change material 155 is entirely contained within the pore.

Regarding claim 15, the phase change material 155 is a chalcogenide.

Regarding claim 17, Moore et al. disclose the phase change material is substantially co-planar with the upper surface of said insulator (fig. 11A).

Regarding claim 18, a select device coupled to said electrode (figs. 12-13 and related texts).

Regarding claim 19, a conductive line formed over said insulator 13 and said phase change material 145.

Regarding claim 20, the phase change material is in contact with said conductive line 110.

Regarding claim 21, the conductive line and the upper surface of said electrode are substantially parallel (figs. 11A-11B and related texts).

Claim 12 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Campbell (6921912 B2) in view of Moore et al. (6,818,481 B2) and further in view of Reinberg et al. (6,777,705 B2).

Campbell teaches the claimed invention as applied to claim except for the phase change material fills less than 25 percent of the pore, the phase change material including Antimony as cited in current claim 12.

Moore et al. disclose the phase change material fills less than 25 percent of the pore (col 1, lines 55-65).

Campbell in view of Moore lacks the phase change material including Antimony.

Reinberg et al. teach the phase change material including Antimony (col 8, lines 46,56).

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the phase change material fills less than 25 percent of the pore , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the phase change material including Antimony in Moore 's method because this particular alloy selected should be capable of assuming at least two generally stable states in response to a stimulus, for a binary memory, and capable of assuming multiple generally stable states in response to a stimulus, for a higher order memory. Generally speaking, the stimulus will be an electrical signal, and the multiple

states will be different states of crystallinity having varying levels of electrical resistance (col 8, lines 56-58).

Claims 13 and 16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Campbell (6921912 B2) in view of Moore et al. (6,818,481 B2).

Regarding claim 13, Campbell teach the claimed invention as applied to claim 11 except for disclose the phase change material fills about 10 percent or less of the pore.

Moore et al. disclose the phase change material fills about 10 percent or less of the pore (col 1, lines 56-58).

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the phase change material fills about 10 percent or less of the pore , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 16, Campbell teaches the claimed invention as applied to claim 11 except for the phase electrode to act as a heater to heat said phase change material.

Moore et al. disclose the phase electrode to act as a heater to heat said phase change material (col 1, lines 55-65)

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the phase electrode to act as a heater to heat said phase

change material in Campbell 's structure in order to greatly enhance the efficiency of the device.

Set of claims 22- 24

Claims 22- 24 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Campbell (in view of Moore et al. (6,818,481 B2).

Campbell teach a system comprising: a processor-based device; a wireless interface coupled to said processor-based device; and a semiconductor memory coupled to said device (figs. 11-13 and related texts), said memory including an insulator 120/122 over a substrate 110, said insulator including a pore having an electrode 170 over the substrate and a phase change material 155 over the electrode 170; and an planer electrode 135 over said phase change material, said phase change material being free of material from said electrode (figs. 11A-11B and related texts).

Campbell does not teach the phase change material fills less of the pore than the electrode.

Moore et al. teach the phase change material fills less of the pore than the electrode (col 1, line 55-65, col 5, line 25, col 6, line 26 and Abstract).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the phase change material fills less of the pore than the electrode in Campbell 's structure in order to greatly enhance the efficiency of the device.

Regarding claim 23, Moore et al. teach the phase change material fills less than 25 percent of the pore (col 1, lines 55-65).

Regarding claim 24, Moore et al. teach the phase change material fills about 10 percent or less of the pore (col 1, lines 55-65).

Set of claims 25- 30

Claims 25- 30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Moore et al. (6,818,481 B2) in view of Reinberg et al. (6,777,705 B2).

Regarding claim 25, Moore et al. teach a memory comprising: an insulator₁₀ over a substrate 10, said insulator including a pore 22 having an electrode over the substrate and a phase 51 change material over the electrode 31/12, wherein the phase change material is less than 25 percent of the height of the pore (col 1, lines 55-65).

Moore et al. do not teach the phase change material including Tellurium.

Reinberg et al. teach the phase change material including Tellurium (col 1, lines 55-65).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the phase change material including Tellurium in Moore's method because this particular alloy selected should be capable of assuming at least two

generally stable states in response to a stimulus, for a binary memory, and capable of assuming multiple generally stable states in response to a stimulus, for a higher order memory. Generally speaking, the stimulus will be an electrical signal, and the multiple states will be different states of crystallinity having varying levels of electrical resistance (col 8, lines 50-60).

Regarding claim 26, Moore et al. teach the phase change material is about 10 percent or less of the height of the pore (col 1, lines 55-65, col 3, line 20).

Regarding claim 27, Moore et al. teach the phase change material fills less of the pore than the electrode (col 1, lines 55-65).

Regarding claim 28, Moore et al. teach the phase change material fills about 10 percent or less of the pore 22.

Regarding claim 29, Moore et al. teach the phase change material is entirely contained within the pore.

Regarding claim 30, Moore et al. teach a conductive line 61 over said phase change material 51 wherein said conductive line and the upper surface of said electrode 31/12 are substantially parallel (fig. 6).

Set of claims 31, 33- 35

Claims 31, 33- 35 are rejected under 35 USC 102 (e) as being anticipated by Gilton (6,855,975).

Gilton teaches a apparatus comprising:

an insulator 12 with a pore;

a damascene structure, wherein the damascene structure includes a first electrode 54 partially filling said pore over a substrate and a phase change material in said pore 58 over the first electrode, said phase change material 58 filling said pore and arranged at the top of said pore, said phase change material being free of material from said first electrode; and

a second electrode 26 over the damascene structure, said second electrode being planar (fig/ 10 and related texts) .

Regarding claim 33 , Gilton teaches the pore and said phase change material have upper surfaces., which upper surfaces are substantially coplanar (fig. 10).

Regarding claim 34, Moore et al. teach the phase change material 58 is in contact with said pore 22.


A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Tuesday and Thursday 6:00am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, M. Smith can be reached on (571) 272-1907. The central fax phone numbers for the organization where this application or proceeding is assigned are (571)272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUNG A. LE 
Primary Examiner
Art Unit 2818